Enclosure 1

FINAL

USACE Response to Comments
1/9/18

EPA Comments Dated 12/20/17
Draft Sampling and Analysis Plan (SAP)
U.S. Army Materials Technology Laboratory (AMTL) Watertown, MA
Dated 11/8/17

USACE appreciates EPA's quick turnaround in reviewing the draft SAP. The following responses are intended to further clarify the USACE approach to this assessment.

General Comment 1: A conservative approach should be used to protect the children at the AMTL Site. 250 days/year is usually the default for a worker scenario, which is not applicable to daycare attendants. For daycare child - use 350 days/year instead of 250 days/year for exposure frequency.

Comment Response: Children are expected to attend daycare while their parents are at work. Therefore, an exposure frequency of 250 days/year, consistent with EPA's default worker exposure frequency, is considered appropriate for daycare children as well. Children would not attend daycare on the weekends (the on-site daycare center is only open Monday through Friday) and as indicated in EPA's comment in the text, it can be assumed that they are off 2 weeks/year when the parents take 2 weeks off. Therefore, the basis of the 250 days/year exposure frequency is that children attend daycare for 5 days/week for 50 weeks/year.

General Comment 2: Sampling step – collect sub-slab soil vapor data at the same time with indoor and ambient air data instead of using the multi-phase approach outlined in the text. The proposed approach is not consistent with EPA VI Guide: OSWER Publication 9200.2-154, OSWER TECHNICAL GUIDE FOR ASSESSING AND MITIGATING THE VAPOR INTRUSION PATHWAY FROM SUBSURAFCE VAPOR SOURCES TO INDOOR AIR Found at: https://www.epa.gov/sites/production/files/2015-09/documents/oswer-vapor-intrusion-technical-guide-final.pdf

In accordance with the FFA§2.6, Army has agreed to follow EPA guidance. EPA R1 requires an internal review of the subslab and indoor air data in conjunction with the available groundwater data (which can be older). We need these 3 lines of evidence to make a decision to mitigate or sample again at a different time of the year and then make a no action or action decision.

Comment Response: USACE's approach was prepared in accordance with EPA's OSWER VI Guidance, and takes into account the size and complexity of the site (large area, multiple buildings, multi-use buildings, large building footprints, different building constructions, etc.), as indicated in the following bullets:

- Characterization of subsurface vapor sources as the first step of USACE's multi-phased approach is in accordance the OSWER VI Guidance, specifically Section 6.3.6, page 86 which states "Characterizing subsurface vapor sources (Section 6.3.1), characterizing subsurface migration (Section 6.3.2), and evaluating the presence of subsurface contaminants in indoor air (Section 6.3.4) – are frequently candidates for an initial objective and each can be pursued separately."

- EPA's guidance is not prescriptive, but recommends "lines of site- or building-specific evidence" to demonstrate vapor intrusion, as discussed in Section 6.4.1, page 88 of the OSWER VI Guidance). Specifically, Section 6.2.2, page 69 of the OSWER VI Guidance states: "At sites where numerous buildings are potentially subject to vapor intrusion (e.g., developed areas with an extensive plume of contaminated groundwater), it may not be feasible or practical at the outset to sample indoor air in each building or soil gas underneath or near each building. In such circumstances, EPA generally recommends a "worst first" approach to prioritize buildings for investigation. Factors that, if known, may warrant consideration in prioritizing buildings for investigation include: Source strength and proximity: Buildings overlying and near a source of vapors in the vadose zone would generally be expected to have a greater potential for vapor intrusion than buildings that do not overlie this same vapor source...."
- The approach presented in USACE's SAP includes the collection of paired sub-slab vapor (or external soil vapor where sub-slab samples are not feasible), indoor air, and outdoor air samples for buildings at which the initial round(s) of sub-slab vapor results indicate further evaluation of the potential VI pathway is necessary (as discussed in Section 11.5 of USACE's SAP). This approach is especially applicable to this site given its size and complexity (i.e., large number of buildings of varying sizes, construction and use).
- The collection of initial round(s) of sub-slab vapor prior to the collection of indoor air will also provide information to support placement of indoor air samples in areas with the highest VI potential.

General Comment 3: TCE in indoor air – EPA needs to do a risk evaluation based on all data provided after each sampling round, and then discuss internally the next steps. We reserve the right to see the results of all lines of evidence and do an evaluation following our guidance. We don't have national action levels but we also don't automatically apply state standards and call them action levels as is proposed in the text. These decisions to sample in another time of the year, to mitigate or proceed with a no action decision document, depends on where the exceeding results are found, who the receptors in the buildings are, how much exceedance over the screening levels, etc. Therefore, do not put in the specific language for short-term TCE action levels in Scenario 2b of Section 11.5.

Comment Response: EPA VI screening levels are proposed in the SAP, as described in Worksheet #11, Section 11.5 and Worksheet #15 as part of the assessment to determine whether there is a potential health risk associated with a complete VI pathway. Massachusetts screening levels are not proposed for use. For TCE, screening levels based on a target non-cancer hazard quotient of 0.1 are 0.88 ug/m^3 and 0.70 ug/m^3 for workers and daycare children, respectively. Given the potential for short-term health effects associated with inhalation exposure to TCE, short-term TCE indoor air action levels (discussed on page WS 11-9) of 7 ug/m^3 and 10 ug/m^3 (accelerated and urgent response action levels, respectively) are also proposed for use to determine whether more immediate/interim action may be necessary. These short-term levels will not replace use of the EPA screening levels in assessment of the VI pathway, but only indicate levels at which more accelerated/urgent response actions would be discussed with the team in order to promptly mitigate exposure. The short-term action levels that are proposed are those published in the July 2014 memo "*EPA Region 9 Response Action Levels and Recommendations to Address Near-Term Inhalation Exposures to TCE in Air from Subsurface Vapor Intrusion*."

The SAP also references Massachusetts DEP guidance in this section to indicate that the short-term TCE levels proposed are also consistent with those recommended by MassDEP. USACE doesn't envision an impact from Massachusetts requirements unless an "Imminent Hazard" is presented, in which a

Massachusetts level of regulatory reporting (under the Massachusetts Contingency Plan / MCP) will be required.

Specific Comment 4, WS 11-7: Please clarify in the text the difference between the limit of detection (LOD) and the detection limit (DL).

Comment Response: The following terms and associated definitions will be added to the SAP, with a reference to them added in Section 11.5, page WS 11-7.

Detection Limit (DL): The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration with 99% confidence. At the DL, the false positive rate (Type I error) is 1%. A DL may be used as the lowest concentration for reliably reporting a detection of a specific analyte in a specific matrix with a specific method with 99% confidence.

Limits of Detection (LOD): The smallest concentration of a substance that must be present in a sample in order to be detected at the DL with 99% confidence. At the LOD, the false negative rate (Type II error) is 1%. A LOD may be used as the lowest concentration for reliably reporting a non-detect of a specific analyte in a specific matrix with a specific method at 99% confidence.

Specific Comment 5, WS 11-9: For Scenario 2b, there is a section discussing VOCs below the LOD and another section discussing VOCs above the risk-based screening level. However, there is no response discussed for concentrations that are above the LOD, but below the screening levels. Please address. EPA will evaluate all data IAW our VI Guide.

Comment Response: The scenario for which concentrations are below either the LOD or the risk-based screening level is discussed in Scenario 1 on page WS 11-7. The associated text is provided below.

> ***"Scenario 1:*** *VOCs are not detected in soil vapor above screening levels at any of the locations in, or immediately adjacent to, a building identified in* ***Table 10-1****:*
>
> - *If two rounds of soil vapor samples collected during differing seasons, at a building indicate that there are no VOCs detected above the limits of detection (LODs) or risk-based screening levels protective of the vapor intrusion pathway for the exposure scenario(s) that apply to the building's occupants (see* ***Worksheet #15*** *for discussion of screening levels), the team will assess the need for collection of an additional round of soil vapor sampling (for a maximum of three rounds) prior to making a conclusion about the vapor intrusion pathway at the associated building in order to account for potential seasonal fluctuations in concentrations. If all rounds of soil vapor sampling at a building indicates that there are no VOCs detected above the LOD or risk-based screening level, the vapor intrusion pathway will be concluded as incomplete and/or insignificant (as applicable) and no further evaluation of the vapor intrusion pathway will be conducted at the associated building."*

Specific Comment 6, WS 11-10: If the attenuation factor is greater than 0.03, Army may need to remove the indoor air source and re-sample as the indoor air source may be masking any VI from the groundwater source area. This issue should be flagged for EPA/Army discussion rather than making a decision at that time.

Comment Response: The text in the following bullets from Scenario 3 will be revised as shown below. (**Bold** text indicates an addition, while ~~**bold**~~ indicates text that will be removed).

- *If the observed attenuation factor for a given compound is greater than 0.03, the data suggest that the primary source of the compound detected in indoor air is likely a non-subsurface source (i.e., an indoor air and/or outdoor air source)* ~~***and the vapor intrusion pathway is considered incomplete***~~*. U.S. EPA's Vapor Intrusion Guidance (U.S. EPA, 2015) recommends a generic soil vapor to indoor air attenuation factor of 0.03 as a reasonably conservative generic attenuation factor for use in screening sites for a potential vapor intrusion pathway. The recommended AF of 0.03 is equal to the 95th percentile value observed at sites in U.S. EPA's vapor intrusion database. This means that the observed attenuation factor for 95 percent (%) of the vapor intrusion sites in the U.S. EPA database is less than 0.03.*

- *If the observed attenuation factors suggest an indoor air or outdoor air source, the results of the pre-sampling building surveys and field notes for the associated building will be reviewed to provide further information on any potential indoor and/or outdoor sources of VOCs that could not be removed prior to sampling.* ***The team will discuss the next steps with USACE, BRACO and U.S. EPA based on the results of this review.***

Specific Comment 7, WS 14-8: IDW. Any off-site disposal will require advance approval from the EPA R1 Offsite rule coordinator. The attached form must be filled out and forwarded from the Army to the EPA RPM. In addition, any work or disposal must also be IAW the GERE and coordinated with the State.

Comment Response: We are aware of this requirement and the proper protocol will be followed.

Specific Comment 8, Figure 10-2: Most proposed sub-slab samples appear to be positioned close to the outside walls in the buildings. EPA recommends positioning some samples towards the center of the buildings or at least closer to the center.

Comment Response: The actual locations will be determined based upon the results of the building survey. We agree with EPA's comment and this will be taken into consideration when selecting final sub-slab sampling locations.

Specific Comment 9: Include a figure of the previous groundwater sampling results for transparency.

Comment Response: A figure will be included.

Comments Provided by C. Vu in SAP Text

Comment 1, WS 10-7: Suggest use default value of 350 days/year for residential exposure. Children go to daycare all year round and it can be assumed that they are off 2 weeks/year when the parents take 2 weeks off.

Comment Response: See response to General Comment 1.

Comment 2, WS 11-3: As suggested in the EPA Vapor Intrusion Guidance, multiple lines of evidence for a vapor intrusion assessment include groundwater data, soil vapor data, indoor and ambient air data along with other factors. Collecting indoor and ambient air data at the same time with collecting soil

vapor data would provide support to establish any relationship between subsurface contamination source with what is measured in the indoor air.

Suggest change this step to include air sampling at the same time with soil vapor sampling, especially for when indoor subsurface soil vapor sampling is planned. It is also important to consider not going back indoor multiple times.

Comment Response: See response to General Comment 2.

Comment 3, WS 11-3: Same comment as above for indoor air data collection.

Comment Response: See response to General Comment 2.

Comment 4, WS 11-6: Please revise the soil vapor and indoor air VISLs for daycare child to consider exposure frequency of 350 days/year as commented above.

Comment Response: See response to General Comment 1.

Comment 5, WS 11-7: See comment above on sampling subsurface soil vapor and indoor air at the same time.

Comment Response: See response to General Comment 2.

Comment 6, WS 11-8: In doing vapor intrusion risk assessment, soil vapor data are not sufficient. Indoor air data would be needed. Soil vapor data are important to establish contamination pathway from subsurface into the overlying buildings.

Comment Response: See response to General Comment 2.

Comment 7, WS 11-8: See comment above – it is not appropriate to use soil vapor data to assess vapor intrusion risks.

Comment Response: See response to General Comment 2.

Comment 8, WS 11-9: The current approach is to collect more than 1 round of soil vapor and indoor air data before making conclusion on vapor intrusion risks. The exception is to take preemptive action to prevent any further exposure.

Comment Response: See response to General Comment 2.

Comment 9, WS 11-9 [short-term TCE action levels]: Need further discussion. Suggest not put this specific language in the SAP.

Comment Response: See response to General Comment 3.

Comment 10, WS 11-14: See comment above.

Comment Response: See response to General Comment 2.

Comment 11, WS 14-13: See comment above.

Comment Response: See response to General Comment 2.

Comment 12, WS 14-13: See comment above on exposure frequency. Please revise the PALs.

Comment Response: See response to General Comment 1.

Comment 13, WS 14-13: Suggest use 350 days/year.

Comment Response: See response to General Comment 1.

Comment 14, WS 15, Table 15-1 [VISL – Daycare child]: Please revise.

Comment Response: See response to General Comment 1.

Comment 15, WS 15-5 [250 day/year exposure frequency]: Please revise.

Comment Response: See response to General Comment 1.

Comment 16, WS 15, Table 15-2 [VISL – Daycare child]: Please revise.

Comment Response: See response to General Comment 1.

Comment 17, WS 15-5 [250 day/year exposure frequency]: Please revise.

Comment Response: See response to General Comment 1.